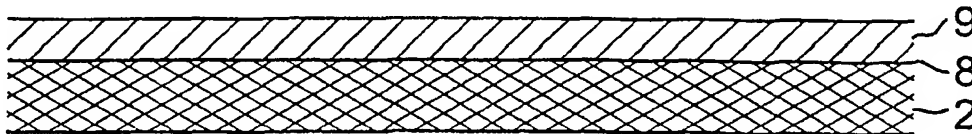


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/FI00/00184 <b>(22) International Filing Date:</b> 9 March 2000 (09.03.00)  <b>(30) Priority Data:</b> 990514                      10 March 1999 (10.03.99)                      FI  <b>(71) Applicant (for all designated States except US):</b> UPM-KYMMENE CORPORATION [FI/FI]; Eteläesplanadi 2, FIN-00130 Helsinki (FI).  <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> SKÅTAR, Rune [FI/FI]; Sundvägen 253, FIN-66980 Monå (FI).  <b>(74) Agent:</b> GUSTAFSSON, Helmer; UPM-Kymmene Corporation, P.O. Box 40, FIN-37601 Valkeakoski (FI).		<b>(81) Designated States:</b> JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Finnish).</i>

**(54) Title:** METHOD TO MANUFACTURE A PACKAGING MATERIAL**(57) Abstract**

The object of the invention is a method for the manufacturing of packaging material. The packaging material comprises cellulose based raw material treated to be grease and/or water resistant (2) for packaging material and a plastic coating (9). Said cellulose-based raw material treated to be grease and/or water resistant for packaging material is pretreated with a surface tension raising agent before coating with plastic.

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## METHOD TO MANUFACTURE A PACKAGING MATERIAL

The object of the present invention is to provide a method for the manufacture of packaging material for the food industry. The material according to the invention is  
5 plastic coated water and grease resistant paper.

The known grease resistant packaging materials have been treated, for example, with chromium complexes, fluorine or silicone compounds. These compounds have either been added to the pulp or applied as a surface treatment. The surface treatment takes  
10 place either as an on-machine or off-machine process. In addition, it is also known in the prior art to coat paper with plastic whereby the paper becomes grease resistant. The coating plastic can be polyamide, polyethylene, polyester, polypropylene or modified polyolefin.

15 It is generally known that good adhesion of plastic to paper requires pretreatment of the paper surface in order to increase the surface tension of the paper. As such methods for increasing surface tension, flame treatment, corona treatment or a combination thereof can be used.

20 The problem with the coating methods of paper is that the known pretreatments, for example flame or corona treatment are no longer effective when the grease resistance treatment is very intense. By means of the method according to the present invention, paper which has undergone intense resistance treatment can be coated with plastic after having first been treated with an agent that raises surface tension.

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The method according to the invention is mainly characterized by what is set forth in the characterising part of the appended patent claim 1.

By means of the method according to the present invention, paper which has undergone  
30 intense grease resistance treatment (kit rating above 5, kit rating means a grease resistance rating obtained by a test method generally known in the field, method developed by 3M) can be coated with plastic, thereby creating durable protection against the penetration of grease through the packaging material. Plastic forms an

effective barrier against the penetration of grease and, in addition, the plastic coating gives protection against abrasion, i. e. sharp edged food pellets will not break the package. An example of such food pellet is dry food for pets, such as cats and dogs, which food also contains grease. The resistance treatment of paper, on the other hand, decisively slows down the progress of penetration of grease when the foodstuff comes in contact with the paper. This is particularly important in the seams of bags and sacks, in which the cut edge of the paper is folded inside the package. Unless the paper has undergone resistance treatment, the grease will soak through the cut edge to the outside of the package.

In the following, the invention is described in more detail with reference to the accompanying drawings, wherein:

Fig. 1 illustrates an extrusion coating line

Fig. 2 illustrates the structure of the packaging material

Fig. 3 illustrates the cross-section of a bag or a sack

In the manufacturing of the packaging material according to the present invention, paper with a grammage in the range of 60 to 100 g/m<sup>2</sup>, for example 60, 90 or 100 g/m<sup>2</sup>, is used. At point 1 on an extrusion coating line, before extrusion die 4, dispersion adhesive of polyethylene-imine type is spread at 0.1-3.0 g/m<sup>2</sup> calculated as solid matter, on paper 2, which has been treated with a fluorine compound and whose kit rating is above 5. The adhesive is dried and the adhesive layer is treated by flame treatment or corona treatment at point 8. Molten plastic 5, which can be polyamide, polyester, polyethylene, polypropylene or modified polyolefin is extruded from extrusion die 4 between pressure roll 3 and chill roll 6. The amount of plastic applied is 12-35 g/m<sup>2</sup>. The pressure roll presses the plastic 5 against chill roll 6 and simultaneously onto paper 2. From the chill roll the coated paper passes to the take-off roll 7, from where the paper continues to the winding of the finished material.

The finished packaging material as illustrated in fig. 2 comprises fluorine treated paper 2, a dispersion adhesive layer 8 and plastic coating 9. Bags and sacks according to fig. 3 are made of the finished packaging material and are sealed by means of heat sealing

with the aid of plastic coating 9. Along the side seam inside the package there remains a cut edge 10 of the paper, which edge has been resistance treated to prevent the penetration of grease.

- 5 It is obvious that the different applications of the invention are not limited to the above-mentioned example, but can vary within the scope of the patent claims set forth below. The dispersion adhesive can be spread on the paper already at the stage of manufacturing the paper, in which case the coating with plastic takes place in a separate process. Other techniques can also be applied for the sealing of sacks than heat sealing,
- 10 for example hot-melt gluing or cold gluing. What is essential is that the method according to the invention enables excellent adhesion to plastic of paper which has undergone intense grease resistance treatment.

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Claims

1. A method for the manufacturing of packaging material, which packaging material consists of cellulose-based raw material treated to be grease and/or water resistant (2) for packaging material and plastic coating (9), **characterized** in that the cellulose-based raw material treated to be grease and/or water resistant (2) for packaging material is pretreated before plastic coating with a surface tension raising agent.
2. A method according to patent claim 1 above, **characterized** in that said surface tension raising agent is a dispersion adhesive of polyethylene-imine type.
3. A method according to patent claims 1 and 2 above, **characterized** in that said surface tension raising agent is added to the paper in connection with the papermaking as a separate process, or in connection with the coating as part of a continuous process.
4. A method according to any of the above patent claims, **characterized** in that said plastic is a polyamide, polyester, polyethylene, polypropylene or modified polyolefin.
5. A method according to any of the above patent claims, **characterized** in that the kit rating of the cellulose-based raw material treated to be grease and/or water resistant (2) for packaging material is higher than 5.
6. A method according to any of the above patent claims, **characterized** in that the cellulose-based raw material treated to be grease and/or water resistant (2) for packaging material is paper treated with a fluorine compound.
7. A method according to patent claim 6, **characterized** in that the treatment with fluorine compound is performed by adding the compound directly to the pulp or as a surface treatment process on or off the paper machine.
8. A method according to any of the above patent claims, **characterized** in that bags or sacks are manufactured from plastic coated cellulose-based raw material treated to be grease and/or water resistant (2) for packaging material, the seam of which bags and sacks being closed in such manner that the edge (10) of said cellulose-based raw material for packaging material remains inside the bag or sack.
9. A method according to patent claim 8, **characterized** in that the seam of the bag or sack is closed by means of heat sealing, hot-melt gluing or cold gluing.

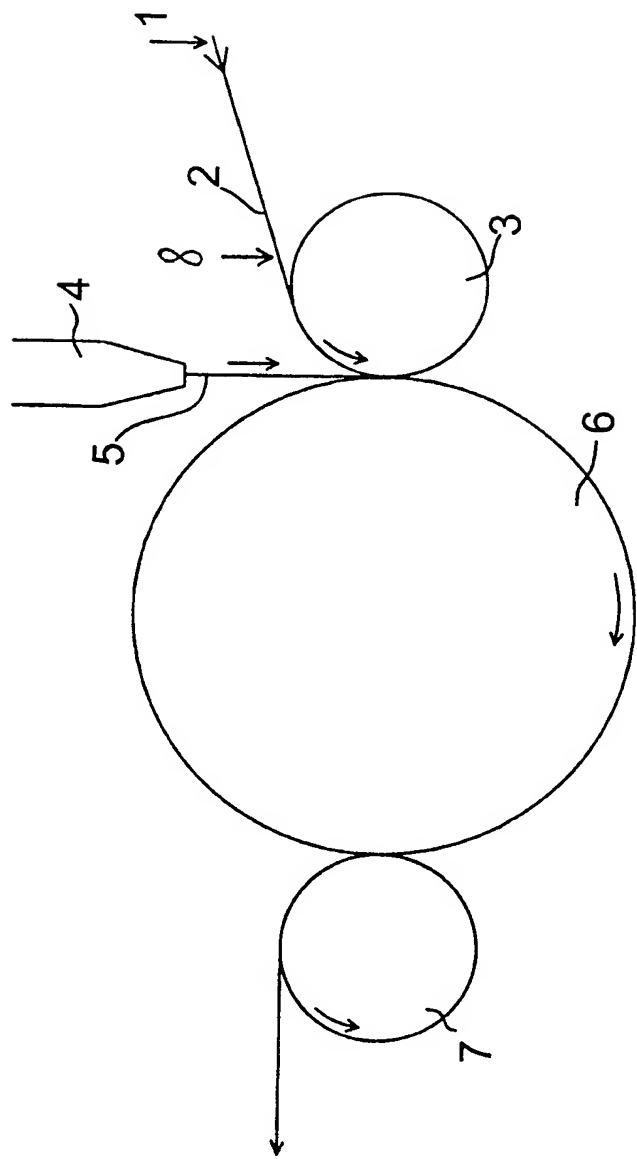


Fig. 1

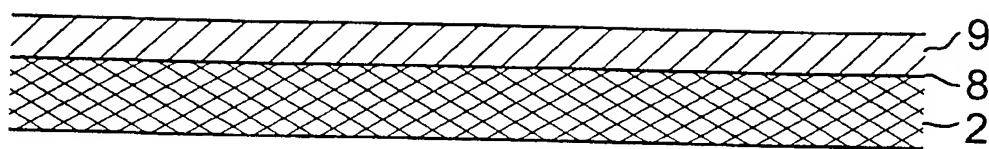


Fig. 2

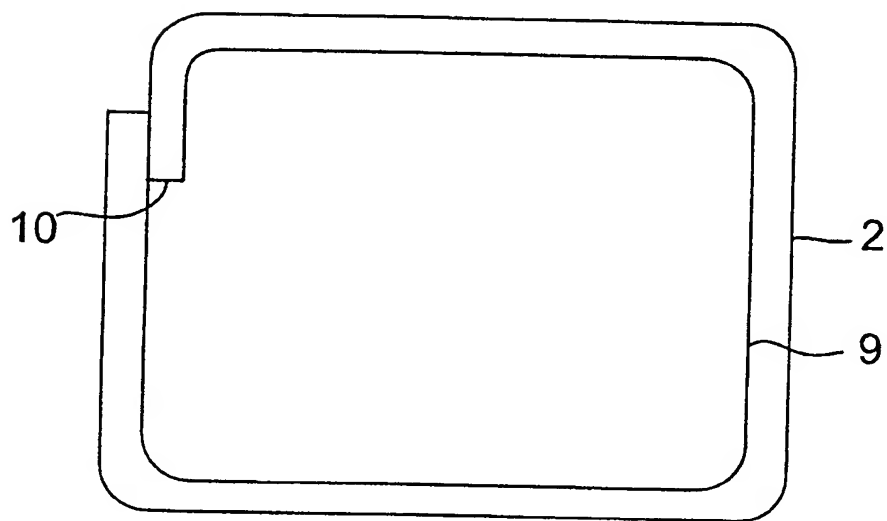


Fig. 3



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00184

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B32B 27/10, B32B 7/10, D21H 27/10

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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